

Nitrate in Drinking Water

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What is nitrate?

Nitrate is a chemical found in most fertilizers, in manure, and in the liquid waste discharged from septic tanks. Natural bacteria in soil can convert nitrogen into nitrate.

How can nitrate get into my well water?

Nitrate can be carried by rain or irrigation water down through the soil and into the groundwater. If your well draws water from this groundwater, your well water may contain nitrate.

Why is nitrate in drinking water a problem?

Nitrate can affect red blood cells and reduce their ability to carry oxygen to the body. In most adults and children these affected blood cells rapidly return back to normal. However the blood cells of infants can take much longer to return to normal. As a result, infants who are given water with high levels of nitrate (or foods made with nitrate contaminated water) may develop a serious health condition due to the lack of oxygen. This condition is called methemoglobinemia or “blue baby syndrome.” Some scientists think that diarrhea can make this problem even worse.

How is nitrate in drinking water regulated?

The U.S. Environmental Protection Agency has established a federal drinking water standard, called a Maximum Contaminant Level of 10 milligrams per liter (mg/L), or 10 parts per million (ppm) for nitrate. Washington State’s drinking water quality standard is also 10 mg/L. Public water systems are required to sample for various contaminants, including nitrate, on a regular basis. There is no required sampling of private individual wells. However, private well owners are encouraged to test their well for nitrate on a regular basis.

Signs of “blue baby syndrome”

An infant with moderate to serious “blue baby syndrome” may have a brownish-blue color due to the lack of oxygen. This condition may be hard to detect in infants with dark skin. In mild to moderate cases babies may have the same symptoms as when they have a cold or another infection (fussy, tired, diarrhea, or vomiting). While there is a simple blood test to see if an infant has “blue baby syndrome,” doctors may not think to do this test for babies with mild to moderate symptoms.

What to do about “blue baby syndrome”

If your baby has a brownish-blue color, bring your baby to a hospital immediately. There is a medication (methylene blue) that will quickly return your baby’s blood to normal.



Prevention of “blue baby syndrome”

The best way to prevent “blue baby syndrome” is to avoid giving your baby water that may be contaminated with nitrate. Infants under one year of age should not drink water exceeding the drinking water standard of 10 parts per million (ppm) of nitrate. Boiling water will kill bacteria that are in well water, but it will not reduce the level of nitrate.

Nitrate in water will not have a long-lasting effect on your baby. If your baby does not have any of the symptoms of “blue baby syndrome” you do not need to bring your baby to the doctor.

Will breast-feeding give my infant “blue baby syndrome”?

Although nitrate has been found in breast milk, there are no confirmed reports of “blue baby syndrome” being caused by a nursing mother who consumed well water that contained nitrate.

Can nitrate affect adults?

Most older children and adults will not be affected because their red blood cells will be quickly converted back to normal. Some people have conditions that make them susceptible to having health problems from nitrate. This includes:

- Individuals who don’t have enough stomach acids.
- Individuals with an inherited lack of the enzyme that converts affected red blood cells back to normal (methemoglobin reductase).

Some studies have found an increased risk of spontaneous abortion or certain birth defects if the mother drank water high in nitrate. Women who are pregnant or who are trying to become pregnant should not consume water that is high in nitrate.

How can I tell if my well water has nitrate?

Shallow wells, poorly sealed or constructed wells, and wells that draw from shallow aquifers are at the highest risk of having nitrate-contaminated water. The only way to know if your private well is contaminated with nitrate is to have it tested. Your county health department can give you information about where you can get your water tested. Nitrate tests usually cost twenty-five to thirty dollars. Nitrate levels can change over time so you should test your well yearly.

Manure and septic tank waste may also contain disease-causing microorganisms such as bacteria and viruses. It is a good idea to test your well for bacterial contamination (coliform bacteria test) when you test your well for nitrate.

Public water systems are tested routinely. Public water systems cannot have more than 10 parts per million (or milligrams per liter) of nitrate. Systems with this high a nitrate level are required to notify their customers.

Need More Information?

For public water systems contact your water utility, or Washington State Department of Health, Office of Drinking Water at 1-800-521-0323 or visit us online at:

<http://www.doh.wa.gov/ehp/dw/default.htm>

For single-family (domestic) wells contact your county health department.